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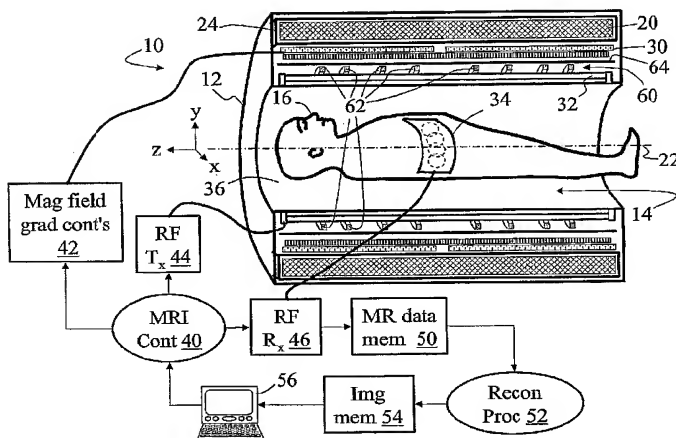
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(54) Title: **MAGNETIC RESONANCE IMAGING SCANNER WITH BOOSTER IRON**



(57) **Abstract:** A magnetic resonance imaging scanner includes a magnet (20) generating a temporally constant magnetic field, magnetic field gradient-generating structures (30) superimposing selected magnetic field gradients on the temporally constant magnetic field, and a radio frequency coil (32) producing a radio frequency field. A magnetic field-modifying structure (60) disposed inside a radio frequency shield (64) includes dispersed particles of magnetic material (70<sub>1</sub>, 70<sub>2</sub>, 70<sub>3</sub>, 70<sub>4</sub>) that enhance the temporally constant magnetic field. The particles are generally smaller in at least one dimension than a skin depth of the radio frequency field in the magnetic material. The magnetic field-modifying structure has a longitudinal demagnetization factor (N<sub>z</sub>) parallel to the temporally constant magnetic field and a tangential demagnetization factor (N<sub>T</sub>) in a tangential direction transverse to the temporally constant magnetic field. The longitudinal demagnetization factor is larger than the tangential demagnetization factor to produce tangential flux guiding.

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